DOCUMENT RESUME

ED 244 470 EC 162 488

AUTHOR Crowner, T. Timothy
TITLE Exceptional Children and Microcomputers, A Survey of Public School Applications.
PUB DATE Jan 84
NOTE 16p.; Paper presented at the National Conference and Training Workshops on Technology in Special Education (Reno, NV, January 25-28, 1984). Light print throughout document.
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Computer Assisted Instruction; Computer Software; *Disabilities; Elementary Secondary Education; Interviews; *Microcomputers; National Surveys; Special Education

ABSTRACT

Telephone interviews on the use of microcomputers in special education were administered to personnel in 25 districts (drawn from a random sample of the largest school districts in the United States) on the following topics: coordination of microcomputers; numbers of microcomputers owned and used; pragmatic uses; funding; brands used; selection, evaluation, and servicing of microcomputers; development of software; and reasons for resistance and suggestions for incentives. Findings revealed a lack of coordination and absence of general awareness on the part of key decisionmakers, a lack of significant efforts to evaluate software or microcomputer programs, and the limiting of applications to low level drill and practice and game activities. The need for coordinators responsible for microcomputer activities is pointed out. (CL)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED244470

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

This document has been reproduced as received from the person or organization originating it.

Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

Exceptional Children and Microcomputers, A Survey of Public School Applications

T. Timothy Crowner

San Diego State University

Running head: Microcomputers

EC 163488

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

T. Timothy Crowner

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Paper presented at the National Conference and
Training Workshops on Technology in Special Education
(Reno, NV, January 25-28, 1984)

Abstract

The implementation of computer technology for students with exceptionalities has received slight recognition according to this review of the literature. The literature contained mostly position papers of an introductory nature. Research surveying public school implementation was conducted to determine what the main thrust was in relation to exceptional students. A random sample of the 60 largest school districts in the United States was included in this investigation. General questions pertaining to uses, administrative procedures, evaluation and financial concerns were addressed. The results demonstrated that special education is actively involved in the infusion of computer technology. However, uses were generally low level drill and practice activities. District coordination was vague and comprehensive evaluations were not being conducted in most districts.

Exceptional Children and Microcomputers, A Survey of Public School Applications

Seventy thousand microcomputers were purchased for educational purposes in 1981 and by 1985 270,000 will be purchased (Wilson, 1982). Microcomputer inventories in public schools are skyrocketing, yet very little is known about what the public schools are doing with all the hardware and software.

Articles on the potential of microcomputer technology in the education of exceptional children, have blossomed with a virtual cornicopia of information. Unfortunately a review of the literature does not reveal the practical application of this technology. In fact, special education microcomputer literature consists primarily of position papers which generally are introductory and motivational in approach.

Two publications of the Council for Exceptional Children have dedicated recent issues to the area of special education microcomputer applications. The November 1981 issue of Teaching Exceptional Children contained articles on software design (Grimes, 1981) and software evaluation (Hannaford and Slone, 1981). These articles were introductory, giving basic suggestions, yet omitting any discussion of actual field based experiences.

The October 1982 issue of Exceptional Children contained 11 articles on special education and microcomputers. These articles represented a comprehensive review of what should be considered

relative to microcomputer usage in special education; the articles by Bennett (1983) and by Budoff and Hutten (1983) were particularly valuable reviews of the strengths and weaknesses of microcomputer technology in special education. However, only one of the 11 articles, Brinker and Lewis (1983) presented a detailed description of an actual program in operation.

A further review of the literature in the area of special education and microcomputers revealed a general orientation of the literature toward position papers such as Cartwright and Hall (1974) or Joiner, Sedlak, Silverstein and Vensel (1981). These articles were helpful direction setters and did a good job of introducing the reader to the potential of the microcomputer as an educational tool. Yet again, they do not shed much light on field based practices.

An exception to the trend of position papers in the literature was discovered in a survey recently reported in the News Letter of the Council of Administrators of Special Education (CASE). The CASE membership was surveyed regarding administrative uses of microcomputers in special education. Of 348 respondents, 163 reported that their districts were using computers in management of special education or would be doing so in the near future Eighty percent of those who were using computers, were using microcomputers, most of which were networked with mainframes. Furthermore, 161 administrators indicated an interest or investment in the future use of microcomputers in their districts. The primary uses reported were business transactions, word processing and data management (Burrello, 1982).

Articles which discussed actual implementation of computers with special education students, focused on uses of computers as enhancement for imput--output ability with the orthopedically handicapped (Tawney and Cartwright 1981; Rushakoff and Lombardino, 1983) or on computer assisted instruction for the deaf, (Nickerson and Stevens, 1974; Von Felt and Subtelny, 1975; and Madachy and Miller, 1976). Articles addressing the applications of technology with the deaf generally described mainframe applications and were based on work performed in the mid--seventies before microcomputers came into popular usage.

An innovative computer assisted instruction program for teaching spelling to learning handicappped students, reported by Hasselbring (1982), described the use of microcomputer hardware as a unique facilitator of corrective feedback procedures. A more general use of microcomputers for drill and practice and tutorials with learning disabled students, presented by Watkins (1980), is valuable for its description of the step by step process used to get started in microcomputer applications in special education.

Given the plethora of articles on the possible use and worth of microcomputers for special education available, the question still remains; what are the public schools actually doing with all that hardware they have purchased? The purpose of this research was to examine what was being done in districts which had purchased hardware and software.

Method

From observations of computer using special educators in the San Diego, California area, a pilot survey questionaire was developed and distributed to the membership of the California Association of Program Specialists which is a group of coordinator level special eduacators from throughout California. No attempt was made to draw a random sample for the pilot survey because the results were intended only to better understand the issues involved. From the observations and pilot survey a list of eight relevant questions were developed:

1) How have school districts chosen to coordinate the use of microcomputers in special education?

2) How many microcomputers are owned/used by special education?

3) What programatic uses of microcomputers are being made by special education?

4) How are microcomputers, owned by special education, being paid for?

5) What brands of microcomputers are being used?

6) How are microcomputers and software being selected, evaluated and serviced?

7) How many districts are developing software?

8) What reasons are given for resisting the use of microcomputers and what incentives would serve to interest teachers in effectively use these devices?

Sample

A telephonic interview, using the eight questions above, was conducted with a random sample of 25 districts drawn from the 60 largest school districts in the United States as listed in the Digest for Educational Statistics (Vance and Eiden, 1982). One district required all questions in written form. These were mailed to the district but never returned by the respondents.

The sample contained total student enrollments of 2,268,476 regular students and 254,062 special education students. The average pupil enrollment was 94,513. Each district provided a full range of service across all categories of exceptionality. Fifty percent of the sample districts served a county, metropolitan area.

It should be noted that the researcher was interested in type of uses where uses existed. In this regard only large districts were surveyed based on the assumption that they would all be using microcomputers for special education. Therefore this research does not indicate the percentage of districts in the United States which use microcomputers with exceptional students, nor, because of the way the sample was drawn, can inferences be made about rural areas.

Results

How have school districts chosen to coordinate microcomputer use in special education? The coordination of microcomputers for special education appears to be joint and generally informal. The individuals who answered the survey questions were varied and included, in rank order: special education director, special

education supervisor, computer coordinator and curriculum director. The initial contact person was always the special education director.

Eighty three percent of the districts sampled reported that a specific individual (computer coordinator) was responsible for coordinating the use of computers. Despite this fact, it should be noted, respondents were often unable to answer survey questions without referral to others and in some cases two or three calls to different district personnel were required to complete the survey.

No clear system of selection or assignment of the computer coordinators was discovered from the respondents.

How many microcomputers are used/owned by special education? This is a two part question because more microcomputers are used by special education than are owned by special education. The average number of microcomputers owned by the districts sampled was 443. Though 100% of the districts sampled reported special education use of microcomputers only 48.82% of the districts reported special education ownership of microcomputers. Of those, who reported special education ownership the majority 21% owned between 1 and 10 microcomputers, 7.75% owned between 11 and 20, 7.14% owned between 31 and 40, and 5.79% owned between 41 and 50 and 7.14% owned over 50.

These figures would seem to imply that a number of special education students are working with microcomputers owned by mainstream programs. Verbal remarks by the respondants supported this conclusion.

An interesting question related to ownership was, how the districts in the sample delivered microcomputer instruction: 42% mentioned that they used a computer center, 58% mentioned that they used in-class hardware and 8.8% mentioned portable units which moved from school to school.

What programatic uses of microcomputers are being made by special education? Three primary areas of use were reported by the respondents: computer assisted instruction by 76%, computer managed instruction by 38% and administrative management by 21%. Only 4% of the respondents mentioned other uses, primarily as input-output devices for students with physical handicaps.

In the general area of computer assisted instruction three subcategories were mentioned: drill and practice by 71%, games by 42% and tutorial by 40%.

What brands of microcomputers are being used? In rank order the brands of hardware used were: 1) TRS 80, 2) Apple, 3) IBM, 4) Commadore Pet, 5) Atari, 6) Texas Instruments and 6) Digital PDK, 7) Digital Dolphin and 8) DEC. Information on which brands were owned versus used by special education in particular was not gathered.

How are microcomputers, owned by special education, being paid for? Funds to support special education microcomputer hardware were primarily derived from a combination of P.L. 94-142 and general fund monies. Other sources of fiscal support reported in rank order were: a) special grants, b) Chapter 1, c) capital outlay, d) P.T.A., and e) miscellaneous gifts.

How are microcomputers and software being selected, evaluated and serviced? Fifty three percent of the respondents indicated

they purchased present hardware because it was a, "good buy". Other reasons mentioned most frequently were, in rank order: 1) experience 2) a special agreement with the manufacturer, 3)software availability, 4) because it was donated, 5) good training was available 6) no formal reason was used in selection and 7) a committee standardized purchases. Other than hardware cost no distinct selection criteria was discovered from sample respondents.

Forty one percent of the sample districts reported that a committee had done some software evaluation. Software selection was made by a committee, according to 68% of the respondents. Other selection methods, in rank order, were: 1) by a person, 2) teacher recommendations and 3) school based approval.

Evaluation of programatic effectiveness was reported by 36% of the respondents. Their evaluation activities were informal and no results were available. Respondents verbalized that they were generally pleased with results of microcomputer activities but no hard data on performace was available.

Fifty eight percent of the districts reported they had made arrangements for service and maintenance of hardware. Of those with arrangements 27% had an inside arrargement and 31% had an arrangement with an outside service provider.

How many districts are developing software. Some software development activity was reported by 63% of the respondents. However, these instances were informal and involved some individual(s) who had shared their work with others in the districts.

What reasons are given for resisting the use of micro-computers and what incentives would serve to interest teachers in the effective use of these devices? Respondents were asked to discuss their perceptions of some reasons teachers resisted using microcoputers in their classrooms. A tally of their responses produced the following rank order: 1)cyberphobia, 2) lack of training, 3) lack of money, 4) lack of software and 5) lack of available hardware.

Incentives needed to work with microcomputers were ranked in the same manner as: 1) training, 2) payment for study, 3) released time for study, 4) equipment, 5) software geared to special education needs, 6) a mentor/helper and 7) a district mandate.

Discussion

A major problem encountered in conducting this survery was that respondents were aware of activities regarding microcomputer uses with special education but no one individual seemed to have a clear picture of the specifics. The researcher observed a lack of coordination and general awareness on the part of key decision makers in the sample. A few respondents were able to answer questions without hesitation but most required referral to several sources and some respondants required a "few days" to pull answers together. An interesting example of this was in the area of service contracts. Individuals who were not directly involved in the selection of computers were not generally aware of service arrangements. Yet service arrangements are a high cost item.

The districts in this sample owned aproximately 10,632 microcomputers. If the average cost of these microcomputers were

estimated at a conservative figure of $2,000 the total investment for microcomputer hardware of the 24 districts sampled would be $21,264,000. In addition one might assume an annual cost of 25% of the initial capital investment for maintenance. That comes to $5,316,000 annually. Yet the respondents to this survey reported no significant efforts to evaluate any aspect of their general or special education microcomputer programs.

Some of this vagueness might be a result of the general dichotomy that exists between general and special education. Respondent verbalizations (by computer coordinators) regarding the location of responsibility for special education and (by special educators) regarding the location of responsibility for computers was charateristic of such a dichotomy.

In general, the researchers conclude that the future of microcomputer use with special education populations is on the increase. However, present applications in the field are generally limited to low level drill and practice and game activities, little to no evaluation is going on and coordination is vague and ambigious. Given any one school district these observations may be tolerable but when the the forcus moves to the total sample, this lack of accountability relative to cost seems unreasonable.

Districts should appoint coordinators who are responsible for microcomputer activities in general and special education. Comprehensive maintenance programs should be addressed. Most importantly evaluation should be a mandate with results quickly disseminated.

References

Bennett, R. E. Applications of microcomputer technology to special education, Exceptional Children, 1982, 49(2) 106-113.

Budoff, M., & Hutton, L. R. Microcomputers in special education: promises and pitfalls. Exceptional Children, 1982, 49(2) 123-128.

Burrello, L. Computer use in special education administration surveyed by case research/special projects committee, a survey report. CASE Newsletter, 1982, 24(1).

Brinker, R. P., & Lewis, M. Making the world work with microcomputers in the education of the physically disabled child. Exceptional Children, 1982, (2) 163-170.

Cartwright, G.P., & Hall, K. A review of computer uses in special education. In L. Mann & D. Sabatino (Eds.) The Second Review of Special Education Philadelphia: JSE Press, 1974.

Grimes, L. Computers are for kids: designing software programs to avoid problems of learning. Teaching Exceptional Children, 1981, 14(2), 48-53.

Hannaford, A., & Slone, E. Microcomputers: powerful learning tools with proper programming. Teaching Exceptional Children, 1981 14(2), 54-57.

Hasselbring, T. S. Remediation of spelling problems of learning handicapped students through the use of microcomputers. Educational Technology, 1982 22(4) 31-32.

Joiner, L. M., Sedlak, R.A., Silverstein, B. J., & Vensel, G. Microcomputers: an available technology for special education. Journal of Special Education Technology, 1980, 3(2) 37-42.

Madachy, J. L., Miller, J. D. The use of C.A.I. in the language

program at Gallaudet. Washington, D.C.: 1976 Gallaudet College (ERIC Document Reproduction Service No. ED 119625)

Nickerson, R. S., & Stevens, K. N. Development of computerized speech-training aids for the deaf. Cambridge, Mass.: Bolt, Beranek and Newman Inc. 1974, (ERIC Document Reproduction Service No. ED100357)

Rushakoff, E. G., & Lombardino, L. J. Comprehensive microcomputer applications for severely physically handicapped children. Teaching Exceptional Children, 1983, 16(1) 18-22.

Tawney, J. W., & Cartwright, G .P. Teaching in a technological oriented society. Teacher Education and Special Education, 1981, 4(3) 3-14.

Vance, G., & Eiden, L. Digest for Educational Statistics, National Center for Statistics, Washington D.C.: U.S. Depository of Publications No. 17498, 1982.

Von Felt, J. R., & Subtelny, J. Description and evaluation of the Webster's Diacritical Markings. computer-assisted instructional program. summary report. Rochester, N. Y.: National Technical Inst. for the Deaf, 1975. (ERIC Document Reproduction Service No. ED153642)

Watkins, M. Microcomputer-assisted instruction with learning disabled students. Phoenix, Arz.: Deer Valley School District, 1980 (ERIC Document Reproduction Service No. ED 205216)

Wilson, K. Computer systems for special educators. in J. Domingues & A. Waldsein (Ed) Educational Applications of Electronic Technology Seattle, WA: Western States Technical Assistance Resuources, 1982.